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The Dzierzon Theory.

BY THE BARON OF BERLEPSCH.

No. III.

Having fully considered the only objection urged against the first proposition, and, as I conceive, finally disposed of the *black bees*, I shall now proceed to discuss the second—arranging it, for greater convenience, under several distinct heads. The second proposition reads thus:

2. In the normal condition of a colony, the queen is the only perfect female present in the hive, and lays all the eggs found therein. These eggs are male and female. From the former proceed the drones; from the latter, if laid in narrow cells, proceed the workers or undeveloped females; and from them also, if laid in wider acorn-shaped and vertically suspended, so-called royal cells, lavishly supplied with a peculiar pabulum or jelly, proceed the queens.

1. *In the normal condition of a colony, the queen is the only perfect female present.*

This will commonly be conceded, even by those apiarians who believe that, in the normal condition of a colony, the drone-eggs are laid by a distinct class of bees, which they call *drone-mothers*. They cannot, however, do so consistently. For if the queen can lay worker-eggs only, and the conjectural drone-mothers lay drone-eggs only, it is not very clear how the queen can be regarded as, in any respect, a more perfectly developed female than those hypothetical drone-mothers. But we need not now discuss this point, because it will incidentally be disposed of when we prove, as we presently shall, that the queen lays the drone-eggs also.

Nor need we do more than advert to the novel notion recently broached by a correspondent of the *Bienenzeitung*, who reconverts the queen into a male—the only one in the colony—and places this male, like the Padisha at Stamboul, on a throne in a seraglio! Though we have hundreds of times seen the queen lay eggs, frequently in our own hands, we have never yet seen a rooster lay any, except boiled ones at Easter, when the children pommelled his tail to test his fertility!

2. *In the normal condition of a colony, the queen lays all the eggs found therein.*

Since no one now-a-days denies that the queen regularly and exclusively lays all the eggs from which workers and queens are produced, the only question remaining is whether, in the normal condition of a colony, the queen lays the drone-eggs also. Though Dzierzon alleges that he has seen her do so more than fifty times, still the fact is not conceded by all; and many of the ablest apiarians continue to controvert the doctrine. We long labored under delusion ourselves in this particular, but publicly recanted the error in the *Bienenzeitung*, No. 8, 1852, when communicating the results of experiments expressly made to ascertain the truth, and which demonstrated the correctness of Dzierzon's position. We will here briefly recapitulate the statements then made:

Experiment 1st.—On the 12th of June, I caught the queen of a colony which contained both worker and drone-brood, and confined her in a cage, which I suspended in the hive among the bees. On the 8th of July, I took out all the combs, brushed off the bees, and examined every cell minutely with a lens, satisfying myself that there was not a single egg to be found. I then reinserted the combs and released the queen. On the 20th of July, I saw worker-brood, and on the 23d, drone-brood, in the cells.

"*Experiment 2d.*—Simultaneously on the 12th of June, I removed the queen of a second colony. On the 21st I took out all the combs and destroyed the royal cells which had been built. On the 8th of July, neither worker nor drone-brood was to be found in any of the cells. On the 31st the combs contained a large amount of drone-brood, namely, 175 larvæ in worker cells, some of which were capped, and 54 in drone-cells. The unhatched eggs I did not count.

"*Experiment 3d.*—I now divided the bees of this second colony, into three nearly equal portions, transferred each into an observing hive furnished with a single empty comb, and carried them to a mill two miles distant from my apiary. This was done on the 31st of July, at 3, P. M. I and my servant, Günther, an enthusiastic apiarian and fearless operator, now undertook to watch them alternately. At 5 o'clock, the bees had deserted two of the hives, and joined their late companions in the third, covering the comb so densely that no observations could be made. Next morning we removed the out-lying bees, and caught and confined all that issued, till the population was so reduced that the cells of the combs could conveniently be inspected. Nine eggs could now be seen in five cells. We continued to watch by turns all day, without detecting any bee in the act of laying. At nightfall, we placed the hive on a table in an arbor, and continued our observations by lamp-light. A few minutes before one o'clock, Günther exclaimed, "now there is one laying!" I instantly lifted out the comb, and Günther transfixing the bee with a needle, as she was withdrawing her abdomen from the cell, in which I inserted a pin in order to mark the spot. Günther now drew out the transfixed bee, and on examining the cell, each of us saw the egg it contained. We then replaced the comb and closed the hive. About an hour later, while we were engaged in conversation, a bee suddenly flew into the flame of the lamp, and I directed Günther to carry the hive out of the arbor. On approaching it, he remarked that the bees were coursing over its exterior in great commotion, evidently in search of a queen. They continued to do so all night, showing that these bees, which had actually been queenless since the 12th of June, were now first really conscious of their destitution; for they departed themselves precisely like bees which have just discovered that they have lost their queen—uttering faintly the usual plaintive moan.

"At 9 o'clock next morning, we transferred the bees to another observing hive, furnished with a comb certainly containing no eggs. My object was to ascertain whether egg-laying would still

be continued. At six o'clock in the evening, I found the hive deserted by all the bees except three; and not an egg had been laid.

"The egg-laying bee thus caught *flagranti delicto*, was precisely similar in size, color, and appearance, to a common worker; no difference whatever was perceptible.

"The results of these experiments, remarkable as they are, speak decidedly in favor of Dzierzon's theory, and as decidedly against the views hitherto entertained and defended by Mr. Braun and myself."

We will merely add now to what was then stated, that last summer we saw the queen of an undoubtedly normal colony, lay eggs in drone-cells, as we shall relate more in detail when we come to consider the third proposition. We must regard all further discussion of this point as superfluous, till the opponents of the doctrine produce new evidence in support of their views, or new arguments to sustain them.

Mr. Kaden, indeed, does advance something *new*, inasmuch as, when questioning the conclusiveness of these experiments, he contends that the confinement of a *fertile* queen and the consequent cessation of egg-laying, are not demonstrative evidence that the drone-eggs were laid by the queen, because the confinement of the queen produces a disturbance in the order and economy of the colony, without yet placing it in the condition of actual queenlessness. This *disturbance* (we may surely be permitted to carry out Mr. Kaden's argument,) causes the drone-mothers to cease laying. Now, if this be not an *argumentum desperatum*, there never can be any. By the removal of a queen, a colony is at once placed in a condition of queenlessness; and why the drone-mothers, which are supposed to labor so beautifully in their vocation while the queen is present, should suddenly cease laying when she is merely put in duress in the hive, we are utterly unable to comprehend. What are those drone-mothers, thus suddenly *disturbed*, to do with the eggs which have matured and are now ready to be deposited? Shall they let them drop? Aye! But, to ascertain whether they do drop them, Mr. Kaden should drum out a colony while drone-eggs are laid, remove the queen, place the bees in an empty hive, and set this on a black-board. Eggs ought then to patter down like hail! Or, he might transfer the bees to a hive furnished with empty drone-combs, in the hope of finding the cells, two or three days after, thoroughly supplied with eggs. Whereas, joking apart, he would not find a single egg in either case.

Let Mr. Kader clip the wings of an unfecunda-

ted queen, and four weeks after examine the hive for drone-brood. Possibly he may find none; but if perchance some be discovered in a few cells, let him then transfer the entire community—queen and workers—into an observing hive, and watch them carefully. We can assure him that he will then soon see the queen lay. He may thus not only satisfy himself of the untenableness of his doctrine that “drone-mothers are regular members of every colony;” but at the same time become convinced that there are queens which, though unfecundated, are able to lay eggs from which living drones can be developed.

Though many apiarians deny generally that, in the normal condition of a colony, the queen ever lays drone-eggs, yet some among them admit that exceptional cases occur when, as in drone-breeding colonies, the queen lays the eggs from which the drones proceed. Others, however, go so far as to assert that, at no time and under no circumstances, can a queen lay drone-eggs. It must be acknowledged that the latter reason more consistently than the former, though they are, in fact, involved in an equally gross error. Instead of relying on sheer *a priori* reasoning, these should take some drone-breeding colony in which eggs are laid with regularity, cell after cell, and in worker cells especially, drum out the bees, and transfer them to an observing hive furnished with empty combs. They will then speedily see, what we and others have often seen, a queen laying drone-eggs, or eggs from which drones will in due time be hatched. Such experiments, however, demand patient observation, and a degree of tact and skill which all do not possess, and which, it would seem, are more difficult to acquire than the art of composing fanciful treatises on bee culture.

3. *The eggs in a normal colony are male and female. From the former proceed the drones. From the latter, if laid in narrow cells, proceed the workers or undeveloped females.*

Against this portion of the proposition, three objections are urged.

A. It is denied by some, that the eggs from which the drones are developed are male, inasmuch as they contend that the drones themselves are not males. This objection will be thoroughly refuted when we come to speak of the fecundation of the queen.

B. Those who advocate the doctrine that special *drone-mothers* exist in every colony, are constrained to contend that imperfectly developed females do not proceed from all the eggs laid in worker-cells; but that some of those eggs produce females perfectly developed, alias *drone-mothers*. We may, for the present, pass over this objection also,

because the doctrine of the regular occurrence of drone-egg-laying workers in every colony, has already been in part refuted, and will be thoroughly discussed and exploded in a subsequent article.

C. Dr. Magerstedt contends that the workers are not undeveloped females, but that the major portion of them are males, and the rest *drone-mothers*, or—consequently—fully developed females. We may here pass this objection likewise, because we shall have occasion to show in our fourth article, that in the absence of drones, no queen ever becomes *perfectly* fertile—that is, capable of laying *worker* eggs. This would unquestionably not be the case, if the males were to be found among the workers.

DELAYED FECUNDATION.

The Baron of Berlepsch, says:—“I have now conclusive evidence that, at least in exceptional cases, a queen can be normally fecundated, after the 21st day of her age, which is the longest term allowed by Huber. On the 26th of June an Italian queen emerged from her cell, and on the 23d of July she returned, for the first time, from an excursion, with marks of fecundation. On the morning of the 26th, I saw eggs in the worker-combs of her hive, and on the 15th of August, young Italian workers issued from the cells. Whether success in a case of such prolonged delay, is a mere and rare exception, I will not undertake to decide.” It were desirable that those who have opportunity to “mark time,” would report their observations, giving us “day date,” whenever a case, not squaring exactly with what “the books tell us,” comes under notice. There is hardly any rule without an exception, yet it would be satisfactory to know, if it can be ascertained, how great a range of deviation or irregularity nature allows herself to indulge in, in the case of the queen bee.

The Ninth Annual Convention of German Beekeepers was held in the city of Hanover, early in September last. Four hundred and fifty members were in attendance, and the discussions, we are informed, were animated and interesting. We expect to receive a full report at an early day.

The Tenth Annual Convention will be held next September, in the city of Gratz, the capital of Lower Styria. Count JOSEPH KOTTERLINSKY was chosen President, the Rev. ANTHONY SEM-LITSCH, Vice President, for the current year. Mr. Andrew Schmid, of Eichstädt, is the stated clerk.

Our friends are requested to send us the names of beekeepers.

(For the "Bee Journal.")

Fertility of the Queen.

A few days since I purchased two bee books published in London the past year. The greater part of one is devoted to the Microscopical Anatomy of the bee, which is very good. The author has evidently used the microscope better than he has his own unaided eyes. From some passages, he is apparently afraid of the insect with which he would familiarize us. In the other book there is not a line which could justify the author in publishing it, and inflicting a loss of time and money upon the reader. There is no necessity, whatever, of importing such bee books—too many of this stamp are issued here. Both the above-mentioned books agree in one thing, viz: The fertility of the queen, which they limit at the *high* figure of 200 eggs a day. Some authors have estimated it at 1500 a day, a few place the limit at 3000 a day. Those unacquainted with bee life, will think it strange there should be so great a difference in the estimates of different men. The fact is, many have too high regard for *authorities*—too many writers are not practical men, or they are too lazy or too timid to investigate for themselves.

According to the size of the hive, the strength of the colony—the season, the number of swarms cast, the amount of stores accumulated, &c., you will find an amount of brood showing that during the past 21 days, (which is the period from the egg to the bee,) the queen has been laying at the rate of 50 or of 3000 eggs a day. The fertility of the queen is influenced by the strength of the colony, the size of the hive, the amount of stores accumulated, the state of harvest, and the temperature of the weather.

A hive is too small to permit the queen to develop her full fertility, if when filled with comb, there are not cells enough to contain all the eggs she can lay. The same condition practically exists in a large hive, when the comb is so filled with honey and bee-bread, that there are but few empty cells for the queen to deposit in. Hives that have cast several swarms in the season, are generally very weak in numbers, although they may possess plenty of stores, in fact "over-wealth." This condition is brought about as follows: After casting a swarm, the old hive remains for from eight to twenty or more days, without a *fertile* queen; in the meantime the workers are actively engaged in bringing in honey and pollen, and in filling vacant cells, which would be used for brood were they in possession of a fertile queen. This state of affairs, if repeated (by swarming) two or more times in a season, the cells remaining vacant

are reduced to so small a number that it is impossible for the queen to exercise her remarkable reproductive power.

The number of eggs deposited by the queen, is limited to the strength of the colony. No more eggs will be laid than the workers can take care of; so it would be unfair to judge of the capacity of the queen from examination of a weak colony.

When the honey harvest fails, we notice the workers prudently commence killing off the drones, except in queenless stocks. Within the hive at at this time one observes less activity in breeding, and no more drone-brood. Where much buckwheat is raised, and fall bee-pasture abundant, you will observe many hives recommence raising drones, and a greatly increased activity in laying, and when the fall-pasture is long-continued and abundant, some swarms will issue.

From the above we may conclude, that both the amount and kind of brood produced, depends upon abundant food.


If engaged in raising Italian queens, as many will be the coming season, you may make more sure of pure impregnation, by increasing your stock of Italian drones through feeding as early as possible in the season, and supplying them with drone-comb, and thus by artificially raising queens, getting them impregnated before the appearance of common drones.


Less brood is produced in cold weather—some springs are particularly unfavorable. Some years, on this account, breeding is so backward, that the honey harvest is nearly gone before hives are sufficiently powerful to take advantage of it.

When all the conditions are favorable, the queen can deposit three thousand eggs a day. This remarkable fertility has been placed beyond doubt by several apiarians, who have taken the trouble, not only to estimate, but to count the cells occupied by brood.

I know I have very imperfectly followed out this subject. I hope from its interest, some more experienced person will do it justice in the "*Bee Journal*," and that, hereafter, no bee book will be published giving the productiveness of the queen at "200 eggs a day." E. P.

New-York.

 Salt, slightly moistened with water and applied to the wound, has in many instances relieved the pain caused by the sting of a bee, and prevented swelling. But, like remedies for the toothache, it is not effectual in every case.

 Eight good days will enable a strong colony to make up for eight bad weeks.



The Queen Bee.

This most important member of the busy commonwealth, has been appropriately called the *mother bee*. Laying all the eggs in the hive, she is truly the parent of the entire population, drones as well as workers. The ancients, indeed, having an imperfect knowledge of the internal economy of these communities, misnamed her *king*, conceiving it to be the office of so distinguished a personage, to regulate and govern the masses. This erroneous notion has perpetuated itself in various countries, even to our day; and we not unfrequently meet with beekeepers who receive it with implicit faith. Yet, whatever be the special opinions of some, the large majority of intelligent apiarists everywhere concur in assigning to her the character she can justly claim—that of being the common mother of the family. So long as she is present in the hive, all the eggs found therein are laid by her. The truth of this may readily be ascertained, by introducing an Italian queen among common bees. All the young subsequently hatched from her eggs, both workers and drones, will wear the livery of the foreign race; and the old stock will gradually disappear, none of their own “kith and kin” being thenceforward produced. It is thus rendered certain, that all the eggs originate with the queen.

But, as the cells in which the drones are bred differ in depth and diameter from those which cradle the workers, and drones are besides reared at certain seasons only, the queen must evidently possess the ability to distinguish between the two kinds of cells, and to lay male or female eggs at pleasure, according to the needs of the colony. That she has this ability is an undeniable fact, however difficult it may be to account for, or explain it. It baffled the ingenuity of numerous observers, till in 1845, Dzierzon submitted a hypothesis, which though at first derided, is now acknowledged to be correct, and sufficient to explain in the simplest manner, the mysterious phenomena which had so long perplexed the shrewdest inquirers. The essential part of this hypothesis is that in the egg, maturing in the ovary of the queen, sexuality is as yet undetermined—the germ being simply vitalized. The determination of sex is an after process. Among

insects, the males occupy an altogether subordinate station, and for their production, fewer or less potential conditions are required, than for the production of females. Hence, in the case of the bee, nothing more is needed for the development of a male germ, than the same natural or maternal influence which sufficed to vitalize the egg, and this is rendered efficient by the passage of the egg through the oviduct. Whereas, for the development of a female germ, the co-operative influence of male sperm is indispensable; and this is effected during the passage of the egg through the oviduct. Accordingly, drones or males owe their existence exclusively to the queen or mother; the workers or females, on the other hand, owe theirs immediately to the queen, but mediately also to the drone by which she was fecundated. The feasibility of all this results from the further circumstance that, in the act of copulation, fertilization does not extend to the ovaries of the queen; for the million of eggs which a fertile queen may lay during her life, are not then, at most, more than inchoately present, if, indeed, they may be conceived of as even rudimentally existing at the time. And that which does not potentially, perhaps not even rudimentally exist, cannot be susceptible of fertilization. The fact, as ascertained by dissection, is simply thus. In copulation, a small sac or vesicle called the spermatheca, situated on the oviduct and connected with it, becomes charged with the male sperm, and constitutes the reservoir from which supplies are drawn as needed. Eggs which, in their passage through the oviduct, become impregnated with the male sperm, as they pass the mouth of the spermatheca, produce workers; and eggs not so impregnated on their passage, produce drones. This fully accounts for the apparent anomaly that certain queens, which were either restrained from copulation, or—having no spermatheca—were incapable of fecundation, or whose spermatheca has in time become exhausted, if they do lay eggs, lay such only as produce drones. A healthy fecundated queen can lay both worker and drone-eggs, at pleasure—the mere exertion or non-exertion of muscular action, sufficing to impregnate the egg during its passage through the oviduct, or suffering it to pass uninfluenced by male sperm.

It was objected to this hypothesis, that life could not originate without sexual concurrence. Yet, in defiance of all *a priori* reasoning, the indubitable fact existed, that drones are produced where no such concurrence occurred; and it was a fair inference, that whatever does actually occur must also be possible, whether we can explain it or not. The objection, however, had to be aban-

done as no longer tenable, when it was ascertained that non-sexual generation unquestionably exists, as a regular mode of reproduction in various other classes of insects. Prof. Von Siebold has placed this beyond doubt, in his treatise on "*Parthenogenesis in Bees and Butterflies*;" so that much as they dislike the doctrine, as contravening long-cherished notions, the most distinguished physiologists now concede its truth. To what extent it may prevail among the lower orders of animals, is not yet known; but it has since been discovered, that it obtains also among numerous classes of plants.

From every female or worker-egg a perfect female or queen can be reared, if it be developed in a wider and longer vertically placed cell, supplied plentifully with the requisite jelly. It is not, however, indispensable that the egg should be originally deposited in such a cell. The bees can transform a common worker cell to a royal cell, even after the larva therein is several days old, by widening that portion not yet occupied by the larva, supplying it lavishly with jelly, and then lengthening it downwards.

It is remarkable, too, that the queen, though more fully developed than the worker, yet emerges from her cell three days sooner. She usually leaves the cell on the 17th day after the egg was laid, if hatched in what the Germans call a *pre-constructed* cell; but will issue from what they call a *post-constructed cell*, sometimes as early as on the 11th, though more commonly on the 12th day after the bees began to transform the worker cell in which the egg was hatched. If a populous colony be deprived of its queen, a swarm with a young queen, undoubtedly reared after the deprivation, will issue occasionally on the 13th, but more generally on the 14th day, counting from the day of removal. The queen usually leaves her cell on the day before the swarm issues; and if the swarm comes on the 12th day, it is manifest that the bees must have chosen for the royal embryo a larva six days old. Consequently the notion hitherto prevalent that queens can be reared only from larva not more than three or at most four days old, cannot be correct. We may rather assume as truth that any worker larva is *capable* of being developed as a queen, so long as the bees have not begun to cap the cell which contains it—though commonly younger larva are selected by them. If just prior to that time, the cell be widened, lengthened, and supplied with jelly, a perfect queen may still be reared, for the sexual organs are formed latest, and are certainly not fully developed till the larva assumes the nymph state.

When selecting a larva for the purpose of rearing a queen, the choice seems to be determined by the location of the cell. It must be so situated that it can be conveniently widened and extended downwards, without involving the destruction of brood; though, when absolutely necessary, brood situated in lower cells, will be sacrificed. Cells on or near the edges of the comb, or on the margin of interior passages, are usually preferred.

The royal cell is used only once for rearing a queen, the bees subsequently destroying it wholly or in part. Where a number of such cells have been constructed, and a mature queen emerges from one of them, the rest are demolished and the embryo queens cast out, if the colony does not contemplate swarming. In such cases the doomed cells are torn open at the side, and the chrysalis removed. A mature queen liberates herself by cutting around the base of the cap with her mandibles, and then emerging through the circular orifice thus formed at the apex of the cell. If we would preserve the supernumerary royal cells from destruction, they must be removed on or before the 10th day, or we may find on the 11th, that the bees have ejected the embryo queens and begun the work of demolition.

After a young queen has been successfully reared, it is still very uncertain whether she will become perfectly fertile. To become so, concourse with a drone is indispensably necessary, and for that purpose she usually leaves the hive on the third day after emerging from her cell. Most writers are of opinion that unless she be fecundated within three weeks from the time when she begins to make her excursions, she cannot produce worker-eggs. Recent observations, however, render it probable that the time is not in all cases so limited. Though the colony in which she was reared have no drones, she may still become fertile, if drones from other colonies are flying while she is on the wing. Drones and queens appear to be attracted to each other by the sounds produced by their wings, and the meeting sometimes takes place at a great distance from the hive to which the queen belongs. This is evident from the production of hybrid brood, in one instance in an apiary situated three miles distant from the nearest Italian stock.

After a queen has become fertile, she never leaves her hive, unless when accompanying a swarm. That this is so, may easily be ascertained by clipping her wings when she has begun to lay. She will thereafter always be found in her own proper hive; and as such a queen continues fertile during life, it is certain that she has no occasion to repeat her excursions. An Italian queen

fecundated by a common drone, produces during life either pure Italian or hybrid workers, and Italian drones exclusively—thus demonstrating that the male eggs are not impregnated. If from accident or disease, a queen loses her ability to lay worker-eggs, she never recovers it.

Queens are sometimes lost during their excursions, being exposed to numerous risks while absent from their hives. Occasionally also they are attacked and killed by their own bees on their return, having probably contracted an offensive odor while absent, which causes them to mistake her for a stranger. This, however, is an exceedingly rare occurrence. Dzierzon says it has happened only twice to his knowledge, in his apiary. They are more frequently killed when entering some other hive by mistake, on their return from nuptial excursions. This is apt to happen when the hives in an apiary are very similar in size, shape and appearance, and stand close together. A young queen may likewise have her wings injured in a conflict with a rival, so as to be unable to fly, and will then be lost when leaving the hive to meet the drones. In such case the colony will inevitably be ruined, unless its condition be seasonably discovered and its wants supplied. It is therefore a useful precaution to furnish every colony, which has an unfecundated queen, with a comb containing eggs and larvæ, that they may have within reach the means of providing a successor, if the queen be lost. Such a colony will exhibit greater industry than one not so supplied, and the young queen will make her excursion earlier than she otherwise would, because there is a higher degree of temperature maintained in the hive. As the queen will always commence laying in the empty cells of the brood-comb thus inserted, it should be placed in that part of the hive where it is desired to have the principal brooding quarter. The lower and hinder part of the hive are the preferable place, because the upper and anterior portions will then be reserved for storage-room. It is also advantageous to select a comb having brood only in the lower ranges of cells.

To ascertain whether a queen which has not begun to lay, has made unsuccessful excursions, catch her and allow her to fly ten or twelve feet in front of her hive. She will immediately return to it, if she was ever out before. An old queen which made her excursion from some other locality will not return to the hive, but seek her home elsewhere—which shows conclusively that queens never leave after having become fertile.

There is a great difference in the degree of fertility exhibited by queens, some being much more productive than others. This results from the more or

less complete development of the body, and the condition of the limbs—especially of the feet. A lame queen is slow, timid and cautious in her movements, hesitates to pass from one comb to another, and reluctantly approaches the edges of the combs. Thus the cells are irregularly supplied, and brooding is repressed. Those queens are best which deposit eggs in a regular and uniform manner, supplying cell after cell, without leaving vacancies. The brood will then mature at nearly the same time, and the queen can resupply the combs without wasting time in search of empty cells. Such queens should be preserved as long as they remain healthy and vigorous; and such as are, in this respect, irregular in their habits should be discarded without delay. The population of a colony and its productiveness depend greatly on the fertility of the queen, and the habit she has of dispatching business methodically.

Fertile as the queens of common bees are known to be, they are yet greatly surpassed by their Italian rivals. Of two colonies equally populous in the spring, the Italian will increase much the more rapidly; and by its remarkable and indefatigable industry, will also surpass it in the accumulation of stores.

It is an interesting question how many eggs a queen may lay in a given time, under favorable circumstances. Dzierzon estimates the number of eggs laid by a vigorous queen, during the swarming season, at three thousand per day, if the colony be populous enough to cover the combs properly. This is certainly not incredible, as queens have been known to lay from 200 to 300 in an hour. Kirsten limits the number at two hundred per day, at the most favorable season. But, as eggs are hatched and the brood fully matured in twenty-one days, if this were correct there could never be more than 4200 cells occupied by eggs and brood. These could be amply accommodated in a single comb, nine inches square—whereas we not unfrequently find a dozen such combs in a hive filled with brood, at one and the same time. On the whole we may confidently assume that a vigorous queen may annually lay from 250,000 to 300,000 eggs, or at least 1,000,000 in the four years which constitutes the average duration of a queen's life. Many of these eggs, indeed, may not be hatched or become fully developed, as the workers are apt to destroy brood, especially when pasturage fails, or the weather proves unfavorable.

It is of the utmost importance in practical bee culture, that the apiarian should possess full and accurate knowledge of the nature and functions of the queen, as the most interesting inmate of

the hive. He should know how she is produced, how fecundated, what are her habits, how she influences and is influenced by the workers, and how differently these treat her before and after she becomes fertile. He who lacks this knowledge will be liable to make many mistakes, whether he relies on natural swarming, or resorts to artificial processes, for the increase of his stock. Thus for instance, if a first swarm from one hive and a second swarm from another, happen to issue at the same time and unite, he must know which of the two queens should be preserved and given to the united stock, if contests among the bees and consequent queenlessness are to be prevented. Again, when an artificial colony is started and an unfecundated queen is given to it, the result will in ninety-nine cases out of a hundred be a failure. The workers, accustomed to the presence of a fertile queen, have little regard for and no attachment to one which does not lay eggs, and will most generally destroy her if free, or cripple her if confined in a cage. Bees will accept an unfecundated queen only after they have for some time been conscious of their queenless condition, and then receive her reluctantly, for want of a better. Under such circumstances artificial colonies would succeed only, if the workers be taken from a colony deprived of its queen, and which has already built royal cells; or from one which sent forth a swarm a few days before.

[From the Rural New-Yorker.]

A PROFITABLE APIARY.

We find, from time to time, in many of our agricultural journals, large and sometimes incredulous accounts in regard to the *profits* of bee culture; and hence it seems to be necessary to furnish proper testimony when such information is given, that it may be received as reliable.

To do this, I would say, without further preliminary remarks, that the apiary of which I am about to state a few astonishing facts, is in the town of Alabama, Genesee County, New York, and is owned by CHAUNCEY S. HARRINGTON, whose P. O. address is Akron, Erie County, in this State, and who will cheerfully verify the following statements, if necessary:

Mr. H. had, in the spring of 1859, five stocks of bees, in the "Weeks' Hive," which is provided with a surplus honey chamber holding two boxes, and well, when full, contain about 25 lbs. These stocks, that season, gave five swarms, which were saved; four put into the Langstroth movable cone hives, and the other into the Weeks' hive. All of these wintered well, so that last spring, 1860, Mr. H. had ten good stocks. How much surplus honey Mr. H. had last season I am unable to say—he had quite a quantity, however. The *increase*, it will be obvious, was quite ordinary.

The ten stocks this season, 1860, gave seventeen swarms, which were saved. All, with the excep-

tion of six, were put into the "Langstroth Hives." Mr. H. has, this season, taken off from the hives of ten stocks and seventeen swarms, 836 pounds of surplus honey, the principal part of which was disposed of by contract, at 14 cents per pound.

836 pounds surplus honey, at 14 cents per pound, \$117 04
17 swarms, exclusive of hive, at \$5.00 each, . . . 85 00

Profits of the ten old stocks, . . . \$202 04


Or, \$20 50-100 per stock! The Weeks' hives—8 in number—gave 213 pounds of surplus honey; nearly 27 pounds each. The Langstroth hives—18 in number—gave 623 pounds of surplus honey; nearly 48 pounds each. It will also be observed that only 21 colonies produced surplus honey; 21 colonies, 836 pounds honey—nearly 40 pounds each.


I presume that some one is now ready to make inquiries:—"Have these colonies honey enough to winter them with safety? Have these colonies been fed?" In reply to these inquiries, I would say that I visited Mr. H. and his apiary a few weeks since, for the express purpose of ascertaining these points. Mr. H. and myself examined each colony thoroughly, and estimated that the colonies would *average* at least 30 pounds of honey, nearly every frame being filled with comb and honey. As 25 pounds is generally sufficient to winter a colony of bees, even in an exposed situation, there will be no danger of losing any bees for want of food. There seems to be but little difference in the weight of each colony in the Langstroth hives, as by means of the frames Mr. L. has been enabled pretty nearly to equalize their contents. Mr. H. informs me that the fields in his vicinity were literally covered with white clover, which secreted an abundance of honey nearly the whole season, thereby affording to his bees extraordinary facilities for laying up large and almost fabulous stores of honey. Mr. L. says that no honey nor liquid of any kind was fed to his bees. Were it not that I apprehend some of the foregoing statements may, by some, be discredited, I would give the profits of one or two of his best colonies. It may, perhaps, be the better way, all things considered, to let what has been said suffice.

In conclusion, let me remark, that the foregoing statements in reference to the honey, were condensed from a memorandum which Mr. H. keeps expressly for the purpose of knowing the exact profit of each colony.

M. M. BALDRIDGE.

Middleport, Niagara Co., N. Y., Dec. 4, 1860.

 In Carniola, bees swarm early and very frequently, in favorable years. In the apiary of the Rev. Mr. Zhuder, of Sava, a swarm issued on the 30th of March, 1847, from one of his hives, and another from a different hive on the 1st April. In the same year, Mr. Zhuffer, of Dani, had ten swarms that year, as the increase of one hive. The parent hive swarmed six times, and the first and second swarms sent forth two each. He obtained ninety-four good swarms from thirteen old stocks.

 Please send us names of beekeepers.

[For the "Bee Journal."]

Suggestions.

Before the season opens it may be for the mutual benefit of beekeepers, if those who have met with difficulties in the manipulation of hives, will suggest a remedy. Sometimes this can, no doubt, be answered at once, by those who have had large experience. If not answered, and the remedy seems feasible, then many might try it, and report through the Journal.

For instance, *to keep frames firm*. It is desirable that the frames in a movable comb hive should be arranged and kept firm in their places. The writer has adopted, for want of a better, the following plan.

An *inch* tack is driven *half-way* into the edge of the perpendicular end of each frame, also into the edge of the top of the frame, (one at each end,) so that one frame cannot approach another within one-half inch; in fact, when a frame is laid down on one of its sides, it stands on four legs. The two outside frames have a perpendicular division in the centre, and on this division is tacked a square inch of sheet-lead. Now, when all the frames are in the hive, a screw is entered from the *outside* of the hive, so that the end of said screw shall strike against this bit of lead. It is easily seen that a screw on the two opposite sides may be turned far enough to press the frames together, and thus a hive may be turned over, and they will not move. Omit the tacks on the outside edge of the outside frames, and you will have room enough after the screw is loosened to push the comb aside, to make room for the removal of a comb. It may be said that the tacks will interfere with the removal of a comb. The top ones will not certainly, and the writer has not found any difficulty in the tacks half way down the sides. A little comb may project over, but the head of the nail scrapes its way without any damage. But avoid, by all means, placing a tack on the *lower* part of the frame, as when removed, the head of the nail would pass over the face of the comb, and nine times in ten, break the caps off the cells.

Another suggestion is

Will Bees build Comb over Paint?

Some author has said they will not. If true, then frames can be painted on the edges and under, side, which will make the removal of combs much easier. Will some one try it and report?

Honey Boards.

The writer has made use of a top to his hives which thus far has worked well. The difficulty is in describing it, so as to be intelligible. Suppose the board is twenty inches long and fourteen

wide; it is clamped at the ends. Let the clamps be fourteen inches long; but the other part is in three pieces; the main piece is, say eleven inches wide. Upon the *ends of this piece* nail or groove on the clamps; thus the ends of the clamps will project over on each side one and a half inches. Make two other pieces *one inch* wide, and long enough to have a tongue on each end, which shall slide in grooves cut out on the inside of the clamps. (If the clamps are grooved on to the main piece, then the grooves are already made, and this is the best way.)


Now, when these pieces are put in place, and pushed in close, you have a honey board so that no bees can pass out when put on the hive. It is not as wide as the hive, however, by half an inch on each side; and the clamps project over that much. Suppose now you wish to put on surplus boxes, you can insert a knife and push out the pieces flush with the outside of the hive, and then there is an opening the whole length half an inch wide, and as the bees go up on the inside of the hive without going over a comb, they can avoid a crowd, and pass directly in the boxes, which of course have a corresponding opening in the bottom. The advantage found from this arrangement has been that, where drone-comb is put on the top to be filled, the width of the opening in the top can be lessened to 5-32ds of an inch, and the queen prevented from depositing drone-eggs, which she may do especially when (as in my case) very little drone comb is left in the main hive. With one exception drones are nuisances, and a half frame of comb is enough for them. Catch one of them coming out of a hive and he has a belly full of honey, but catch one coming back and he is empty—has digested all he had and apparently comes back for more.

I will conclude by asking those who have not read Mr. Quinby's "*Appendix*," to send for one, (its cost is, I believe, 10 cents.) It is not only valuable in itself, but it is worth much more than its cost, if only to show how an upright, straight-forward Apiarian can gracefully acknowledge an improvement, (that of movable combs) when it is made plain to his senses by practical experiment.

I have yet to see the man who is more reliable than Mr. Quinby; and any one who has read his book and noted the carefulness of his statements in all that pertains to beekeeping, will feel disposed to place a high estimate upon his opinion in favor of Rev. Mr. Langstroth's (Eclectic?) hive.

Whitemarsh, Jan., 1861.

ARIS.

 Please send us the names of beekeepers.

[For the "Bee Journal."]

Diseases of Bees.

Our object in placing before the readers of the Bee Journal, the following, drawn from H. Hamet, with a few remarks of our own, is as much to elicit, as to impart information. So far, we have had very little experience in diseases of bees, and desire to increase our knowledge from the experience of others.

H. Hamet remarks: "Bees, like other creatures, are subject to various diseases. Less, however, than some animals, on account of their activity, industry and frugality, and they do not create for themselves any artificial wants. Their troubles mostly come from the want of care, and ignorance of their owners. Colonies in a wild state are more free from disease.

"The most dreaded diseases are dysentery, constipation, and foul-brood.


"**DYSENTERY.** In a normal condition, bees never void their excrement in the hive, they always go out for this purpose. This affection is generally noticed at the end of winter, when they have been retained prisoners in the hive for one or two months, by cold or rain. In this condition, they have no regard for the clothes of those passing near them, nor for linen spread on the grass to dry, close to the hive. If the air of the hive is rendered unwholesome by humidity, or any other cause, the bees, if confined, are soon attacked by dysentery. The interior of the hive, the combs, and many of the bees, are covered with filth. The air of the hive is offensive, and the colony perishes. No time is to be lost in giving aid to a hive sinking by this disease. Reverse the hive to get rid of the bad air. Cut out the filthy combs, and cleanse the hive as much as possible; allow them plenty of air, and feed them with a little good honey, slightly warmed. Some advise to add a little salt and wine to the honey. In such case, the salt is of no benefit; as to the wine, we advise the bee-keeper to drink it himself, so as to gain more strength to give his bees better care. He will then bear in mind that strong colonies, with sufficient stores and well-protected hives, are never attacked with dysentery. It only occurs in colonies lacking in stores; in those which have received in cold weather, inferior honey, or poor sugar-syrup containing too much water, which remaining unsealed, becomes sour and unwholesome; and in those colonies lodged in poor hives, badly sheltered, and in a damp place. This disease occurs in autumn, but chiefly at the close of winter."


We one year lost several hives from this cause,

and attributed it to having fed them late in the autumn, on refined sugar too much watered; and the cells in which it was stored remaining unsealed, it soured. If the hives had been properly ventilated, much of the water would have evaporated, and the acidity prevented. Since that time we have not lost a hive from this cause, except one which was over-populous, and not having sufficient ventilation, they became restless from over-warmth in the spring, while the weather was still too cold for them to fly out. On examination, the hive contained plenty of honey where the dead bees were clustered, but the combs showed a want of ventilation; they were damp and mouldy, and very filthy. Mr. Hamet describes another disease which sometimes attacks weak colonies in poorly protected hives—**CONSTIPATION**; which he attributes to the distention of the abdomen by feces, during very severe weather; the liquid portion becoming absorbed or evaporating, the bee cannot void the solid mass remaining. In this condition, they will not partake of food offered them, and a state of stupor supervening, they soon die. Hamet considers that both dysentery and constipation may become contagious in an apiary, if neglected until the air is affected by the odor of the diseased bees, and their excrements. This may possibly be true where the hives are kept in large numbers very near each other; but we are inclined to think, that the above conditions, and also foul-brood, are spread by bees robbing infected hives—the honey having been tainted by the bad odor of the hive. Honey made in a red cedar or a pine box, is impregnated with the odor of the wood. Honey stored in mouldy comb is very unpleasant in flavor, but we are not aware that it is injurious to bees. It certainly cannot benefit them.

We would be pleased to hear from the correspondents of the Bee Journal, on the matters so imperfectly treated in this article. Also, if any recent developments have been made in the cause and cure of foul-brood.

E. P.

 The bees introduced into Australia have multiplied rapidly and largely. They labor there almost the year round. The honey produced in the spring remains liquid; the winter honey is thick and of a doughy consistence at first, but speedily crystallizes. The quality of the honey is excellent, though differing according to the location of the apiary and the kind of pasturage. That gathered in the southern districts of the country is extolled as the best.

 The bees cultivated in the northern districts of China, appear to be only a variety of the common kind, somewhat smaller in size.

The Italian Bee.

BY THE REV. GEORGE KLEINE.

(Third Article.)

It cannot be doubted that among the great number of persons engaged in bee culture, comparatively few will take pains to familiarize themselves thoroughly with the theory. The Italian bee would consequently never become extensively distributed in the country, if she could be used only in the interest of science—that is, if she did not likewise possess qualities decidedly important in the practical relations of the business. But, in this respect also, this new race promises to be a highly valuable acquisition. If she really possesses the excellencies ascribed to her; if it be not merely the charm of novelty that has engendered the enthusiasm evinced for the stranger, we may indeed indulge anticipations of most gratifying results.

But what are the good qualities claimed for the Italian bee, which entitle her to a preference, in practical bee culture, over the kind hitherto cultivated?

Capt. Balenstein, who was simply a disinterested observer—never having reared any except for his own use—early remarked her superior productiveness; and Dzierzon, long before there was a demand for them, save for scientific purposes, found Capt. Balenstein's observations confirmed by his own experience. His original colony arrived from Italy in the month of February, and on transferring it to one of his own hives on the day after its arrival, he found that two combs, each about eight inches square, were filled with brood in the various stages of development. The queen must therefore have laid on an average, about three hundred eggs per day, in the preceding three weeks, notwithstanding the unfavorable state of the weather at that early season, and the annoyances to which she must have been exposed during the transportation of the hive. In the course of the ensuing summer, moreover, he took from the original stock, combs containing more than sixty thousand cells filled with brood, to supply the numerous artificial colonies in which he was rearing queens, and the stock remained populous nevertheless—storing up an unusual quantity of honey. Mr. Hübler of Altenberg, at the close of May, took an Italian queen and twelve ounces of bees with a sealed comb of common brood, and established them as an independent colony. They multiplied so rapidly, that though he took from it a brood-comb subsequently, they still filled the main chamber of their hive with

combs, and gathered sufficient stores for the winter. Similar evidences of the extraordinary fertility of the Italian queens have been furnished besides, in numerous other cases, so that their superiority in this respect cannot well be doubted—though possibly some portion of the striking difference may be attributable to the greater care and attention which the Italian stocks have received from their owners.

Another superiority claimed for the Italian bees, is their disposition to swarm early in the season. This point is fully conceded by Capt. Balenstein, who says likewise, that the half-breed stocks inherit this disposition. I cannot myself venture to give an opinion, as I practise artificial multiplication exclusively in my apiary, and have therefore had no opportunity to institute a comparison. But if the queens commence ovipositing earlier, and are more fertile than common bees, it may be regarded as a fair inference, that the stocks would sooner be in a condition to send out natural swarms. If, however, their fertility, like that of the common kind, depends on or is governed by seasons and circumstances, the earlier or later issuing of swarms will be regulated accordingly. The matter is, moreover, of no special importance in practical bee culture, as the experienced apiarian knows how his bees should be treated, so as to subserve his purposes in this direction.

In our variable climate, where thousands of bees perish from the vicissitudes of the weather, it would be of greater practical importance if the Italian bee should prove to be more hardy than the common kind. Dzierzon remarked evidence of this trait in them, soon after he obtained his first colony. On the 12th and 13th of March, while the ground was still very generally covered with snow, he saw, with surprise, that they were busily carrying in pollen; and very few of those that dropped on the snow, became chilled. Though natives of a warmer climate, and therefore might be presumed more sensitive to cold, he thinks the apparent paradox of greater hardiness may be explained, by supposing that in their native land, where the mornings are cool and the nights are frequently cold, they instinctively labor early, because the nectar of the flowers is dissipated by the fervid heat of the day. He also carried Italian and common bees into a cold room, and found the former were still actively fluttering at the window, when the latter had already become benumbed. The Baron of Roschütz reports the same fact of the bees of Carniola—which are identical with the Italian—stating that they begin to work generally while the ground is still partially covered with snow, enduring the

frequent, sudden, and violent changes of weather with surprising immunity. Similar observations have been made by our peasants, who knew nothing more of the Italian bees, than that they were peculiarly marked. Thus one of them said to me recently, "the Italian bees must be hardier than mine, as I saw them on some early blossoms this spring, at a time when mine had not yet begun to work." The Baron of Berlepsch, however, expresses a doubt whether they are hardier, though he admits his inability to form a conclusive opinion, because there was no snow remaining on the ground when his bees began to fly. In the rough, cold weather of April and May, more of the Italians perished, because these ventured forth in defiance of the chilling blasts, while the common bees remained snugly esconced in their hives—certainly no indication this, on the part of the latter, that they felt themselves to be constitutionally as hardy as the former. No one, surely, would expect them to be wholly insensible to cold; but the apprehension largely entertained that, as natives of a warmer country, they cannot stand this climate, may be dismissed as groundless, since they have safely passed through several very rigorous winters here.

Dzierzon thinks that their superior ability to endure cold, arises in part from their surprising activity and agility—peculiarities which the Baron of Berlepsch also concedes to them, and which he says they display most remarkably, when attacked by or attacking other bees.

Connected with these traits is also their manifest superior courage. They are the boldest champions and bravest defenders of their hives. They are much more vigilant, and far less liable to be caught "napping," than our common bees. Every stranger, of whichever race, attempting to enter their hive, is at once repelled, or arrested and dispatched; and it is hardly conceivable that an Italian colony, having a queen, could ever be overpowered when attacked by our common bees. The frequent examination of my artificial colonies, which were necessary while I was rearing queens, often exposed them to most persevering assaults, but they invariably succeeded in beating off the assailants. I have no doubt that our common bees so frequently fail in successfully defending themselves, chiefly because they are not sufficiently alert and agile—qualities which the Italians, undoubtedly possess in an extraordinary degree. So completely have I satisfied myself of their courage and conduct when hostile demonstrations are made against them, that I never have the slightest misgiving as to the result. On the contrary, it has become one of my amusements to

witness the conflicts, and observe how speedily the Italians achieve the victory. I no longer employ precautionary measures to prevent attacks, knowing them to be wholly superfluous. The testimony of Mr. Rothe is to the same effect. He had occasion to observe that a weak artificial colony, consisting of only about thirty workers with a fertile queen, long successfully resisted the attacks of a populous Italian colony, though it finally had to succumb. "Hercules himself must yield to odds." This noble trait can hardly be over-estimated, and it alone would unquestionably entitle the Italian bee to the palm of superiority. We might indeed infer from it, likewise, a greater propensity to rob—a quality not exactly of the most praiseworthy sort. But the propensity to rob is an heirloom in the entire family of bees, and the Italians may, perhaps, be entitled to claim a somewhat larger share of it. The Baron of Berlepsch says, they endeavor to force an entrance into every other hive; and another observer states, that wherever there is anything sweet to be licked up, the Italians are always sure to be first on hand. Mr. Rothe says—"with an eager yearning after honey, they are ever inclined to rob, and if there is anywhere within reach, a weak colony to be sacked, the Italians are certain to secure the lion's share of the spoil." Similar accounts have reached me from various other quarters, and I have myself had demonstrative evidence, both of their disposition and skill to appropriate the stores which others had faithfully garnered. But I have also found that all this is harmless, if the propensity be not fostered and aided by the mismanagement of the despoiled colony.

The disposition to rob results from an inordinate desire to accumulate stores of honey, and if displayed more strikingly by the Italian than by common bees, it manifestly presupposes in them a higher degree of industry—a trait, in fact, for which they are preeminently distinguished, and for which Capt. Baldenstein already awarded to them the highest praise. He found that, under precisely similar circumstances, his Italian stocks always secured more ample stores than his common hives, and could generally spare some surplus honey, when the latter had not even laid up enough for the winter. Dzierzon early noticed the decidedly superior industry of these bees, as he saw his newly-obtained colony carrying in pollen in March, while the ground was still covered with snow, and his common bees were inactive. Fearing that it might be stolen, he screwed the hive containing the strangers fast to its stand in his apiary, and so left it during the summer, transferring from it, from time to time, combs

containing worker and drone-brood, for the purpose of rearing queens. On the 23d of June, the drones were expelled, and all hope of further multiplying pure stock that season terminated. He now let the hive remain undisturbed, and the bees, for a considerable time, labored with the most remarkable industry. But gradually they relaxed their efforts, and when the buckwheat, sown on rye-stubble, came into blossom, they were clearly outtrivalled by the common stocks and some late-made colonies. Still, as young bees continued to make their appearance, he felt assured that the hive was in a healthy condition. Late in the fall, when he undertook to remove it into winter quarters, he found it so heavy that he could not lift it. The cause of their apparent remissness was now obvious. Having early rid themselves of a host of useless consumers by expelling the drones, they had in a short time filled all their combs with honey, and were thenceforward constrained to remain idle for want of storage room.

An apianian friend wrote to Dzierzon—"I can now unhesitatingly recommend the Italian bees. Whilst during the past summer our common bees were comparatively indolent, the Italian were perseveringly busy, adding perceptibly to their stores from day to day; whereas the common stocks were constantly diminishing in weight. I frequently opened the hives and found that while the latter had stored up little or nothing, the former not only contained a good store of honey in capped combs, but also a large quantity freshly gathered in open cells. I could observe, too, that they visited many flowers to which I never saw common bees resort, and this fact helps to account for the surprising difference in the results."

In May, 1855, Mr. Hubler stocked the lower section of an observing hive with a small Italian colony, which they speedily filled with comb, storing every unoccupied cell with honey. He then gave them access to the upper section, placing an empty comb therein. In a few days this was stored with honey, and the bees ceased to labor for want of room. He removed the full comb and inserted an empty one, and the little colony immediately resumed work with their former zeal and industry. He had stocked a similar observing hive at the same time, with common bees, but these only filled the lower section.

In the *Bienenzeitung*, Mr. Rothe gives the following as the result of his observations on the superior industry of these bees: "On the 14th of September, 1854, I removed the queen of a second swarm, and introduced a young Italian queen in her stead, which produced a numerous

progeny in the course of the fall. Early in the ensuing spring the remaining common bees disappeared. The colony, though at no time very populous, worked very industriously, and when the brooding apartment, containing 1920 cubic inches, was filled with honey and brood, the bees were allowed access to the honey chamber, containing 1200 cubic inches, which they likewise fully stored with honey. The supply in the brooding apartment was more than sufficient for their wants next winter. A half-breed colony, placed in a square box hive, containing 2730 cubic inches, filled it completely, and its weight is so great that I cannot lift it. On the 22d of June, I drummed out a swarm from an Italian hive, which by its industry soon worked itself into a good wintering condition. The parent hive and a hive of common bees were then interchanged, and I thus obtained two swarms of mixed bees from the former, each having a young Italian queen. After the second swarm issued, I transferred the parent hive to a new location, and set the swarm in its stead; both have done exceedingly well, the parent hive being now very heavy. I drummed out a swarm on the 17th of July, from another Italian hive, and removing the parent hive, set the swarm in its stead. The swarm gathered sufficient for the winter, and the parent stock has a large surplus to spare. This district is only moderately favorable to bee culture, and the larger number of my common stocks are rather poor. Hence, I cannot but regard it as a fact, that these comparative results have conclusively demonstrated the superior industry of the Italian bees." A year later, Mr. Rothe reiterated this opinion, as based on further observations, thus:—"That the Italian bees are more industrious than the common kind, is no longer doubted by any beekeeper who has had both kinds in his apiary. The present year, like the two preceding, was unfavorable to the bees, during the principal gathering season. My common stocks have very little honey to spare—some of them, indeed, have scarcely a supply adequate to their own wants, whilst all my Italian stocks have ample stores, and a large surplus."

In 1854, the Baron of Berlepsch stated that he was thoroughly convinced, from personal observation, of the superior industry and greater practical value of the Italian bees. In the fall, when the wasps attacked his grapes, the Italian bees followed in their wake, at once appropriating the juice of every punctured berry. If honey, or dissolved sugar, or any saccharine liquid, was left exposed, the Italian bees were sure to be attracted by it long before the common bees made the dis-

covery. Recurring to the subject in 1856, he stated that he had no opportunity that year to make comparative observations, but that in the apiary of his friend, Mr. Eberhard, the Italian bees had so greatly excelled the common kind in honey-gathering, that the fact of their superiority in this respect could no longer be called in question. At the Apiarian Convention in Güstrow he made a similar declaration, and reiterated it also at the Convention in Dresden, a year after—adding that when, early in the spring, a few flowers were expanded, the Italian bees never failed to visit them in search of nectar. But he appeared to apprehend that this good quality did not lead to corresponding results, because it seemed to him that their queens' fertility became exhausted sooner, and they were more disposed than common bees to produce drones in excess. Nevertheless, if their superior industry be conceded, the apiarian has it in his power to obviate the other disadvantages, by a seasonable renewal of the queens, and a judicious and careful suppression of drone-brood.

In addition to their admitted industry, the early expulsion of the drones has an important bearing on the productiveness of colonies. An early riddance of supernumerary consumers must exert an obvious influence on the preservation of stores, and enable the bees to enjoy the full benefit of their labors. The fact thus becomes of practical value to the beekeeper, as increasing his chances of success. The fact itself has, indeed, been questioned; but it has been so frequently observed, that it cannot well be longer held in doubt. Thus Mr. Saghy, of Hungary, says: "The most important advantage presented by the Italian bees, is the greater quantity of honey which they gather and store up. And according to my observations for three years, this advantage results mainly from the earlier expulsion of the drones, to which they are instinctively prone."

Another and highly important quality, in a practical point of view, possessed by the Italian bees, is their mild and tractable disposition. A dread of the bees' sting does undoubtedly, to a large extent, operate to the discouragement of bee culture. There are many timid persons, who are alarmed by the presence of the insect; and others, less sensitive indeed, still cannot approach a hive without painful apprehensions. Others again, though disregarding the momentary pain inflicted by the sting, suffer so much from the swelling which ensues, that they feel constrained to forego the pleasures of a pursuit which exposes them to such risks. These objections are, in a great measure, obviated by the introduction of the

Italian bee, which is assuredly less irritable than the common kind. It certainly can and will sting, but generally does so only on provocation. In comparison with the common kind, they may justly be termed gentle and peaceable. Their animosity becomes excited only when they are accidentally annoyed, or intentionally irritated. In close, warm weather, or during great heat with abundant pasturage, when common bees are inclined to be very troublesome, we may unhesitatingly approach an Italian hive, or stand in front of it, without incurring the displeasure of its inmates. With due care and coolness, all necessary operations may likewise be performed with impunity. They sometimes threaten, though they seldom sting; whereas, with common bees it is usually a threat and a blow, though the blow comes first. The Baron of Roschutz bears the same testimony to their gentleness, and adds that he has never been stung. Though I cannot go to that extent, I must still concede that almost invariably, some act or movement of mine provoked the infliction.

True, this gentleness has been denied in some quarters, but the difference may have been produced by the treatment which the bees received; and there may be instances where an Italian colony proved to be excitable and refractory, without any apparent cause. These must be regarded as exceptional cases, especially since it has been ascertained that the same colonies in other hands and under different treatment, evinced no such irascible disposition. Thus, at the Dresden Convention, Count Stosch stated that he once had an Italian colony in his apiary, which exhibited such an unamiable temper that he resolved to banish it. The queen was transferred to a colony in a distant apiary, where her progeny showed no symptoms of a pugnacious spirit, and the old colony, after rearing another queen, became as gentle and tractable as all his other Italian stocks were.

This mild and peaceful character of the Italian bee is now so generally acknowledged, that some have fancied it should be regarded as, on the whole, an objectionable trait. Even the Baron of Berlepsch conceives it to be problematical whether this gentleness is a recommendation, as he considers it desirable that mischievous boys and designing knaves, should be kept at a respectful distance by the dread of this insect's formidable weapon. He would rather submit to the infliction of a dozen stings daily, than be deprived of so efficient a protection for his hives. But to the great majority of beekeepers, the consequences of a sting are exceedingly unpleasant, and some have

been induced to abandon bee culture on that account alone. Hence Dzierzon has justly remarked:—"Though I disregard stings myself, it is very disagreeable to find our visitors occasionally annoyed and wounded by the bees, or to have one's neighbors complain of them as a nuisance, which the police should abate, to secure the safety of children. No such unpleasantness, and no such dangers, need be apprehended from the cultivation of the genuine Italian bee."

BEES IN CALIFORNIA.

The following is among the latest items of news from the land of gold:


THE BEE ANNOYANCE IN CALIFORNIA.—Since the extensive importation and production of bees in California, they have become, in many respects, a source of great annoyance. The housekeeper in cooking, the grocer and fruit-dealer, all have them swarming by hundreds, and perhaps thousands, around their premises, rivalling the house-fly in troublesome propensities. A Sacramento coal-dealer recently obtained a quantity of coal which had a cask of molasses broken over it. When the coal was brought into the yard, the bees collected in such quantities that he spent half a day with a hose in washing off the coal in order to remove the temptation. They have partially destroyed the produce of several vineyards near Sacramento; when the grapes were gathered it was found that the little thieves had extracted the juice. As a matter of course, a large number of bees are necessarily destroyed while poaching on forbidden ground. Is there no remedy for these difficulties? asks the *Sacramento News*. Can bees be kept from annoying everybody but their owners, and at the same time preserve their own lives; or must the evils complained of continue to increase in magnitude?

This annoyance to housekeepers, grocers and fruit dealers, results, we suspect, chiefly from carelessness and mismanagement, just as that from houseflies does, measurably, in every clime and country. In the latter case, cleanliness is found to be the most effectual corrective; and in the former, due care not to lead the poor bees into temptation will doubtless prove to be an efficient preventive. If the housekeepers will keep their luscious confections, the grocers their sugars, and the fruit dealers their sweetmeats, under due supervision and guard, the bees will cause them very little trouble—especially if, at the same time, they keep their tables, counters, and boxes fastidiously nice and unbedaubed.

Bees, like flies, make their annoying visits mainly on special invitation, and are very apt to retire as soon as they discover that no provision has been made for their entertainment. They are not fond of "short commons," and never linger long where there is not an odor of welcome. Nature has given them a *carte blanche* to appropri-

ate whatever is sweet to the taste, and to interpret every well-flavored aroma as a loud call for their presence. They are not particularly abundant in these parts, yet a few months ago a worthy dame, residing within a furlong of our sanctum, undesignedly tempted them to visit her in countless multitudes. She had placed a pot of honey on her kitchen stove, to warm, but, being busy about other matters, the pot began to boil, and boiled over before she was aware. The overflowing honey ran down in streams on the stove, and thence ascended in fumes, filling the air with a sweet-smelling savor. The ever-watchful and wide-awake bees soon snuffed a treat in the "tainted breeze," and in a few minutes the kitchen was filled with these "winged worshippers" of sweetness, thronging in from all quarters—some even descending the chimney. Here was an "annoyance," with a vengeance; and well might the good woman exclaim, with him of the *Sacramento News*, "is there no remedy for these difficulties?" The seething pot was forthwith snatched from the stove, by her husband, and hurriedly deposited in a dark corner of the cellar; the stove was promptly sponged with a wet mop, and when the grateful fumes ceased to exhale, the unwelcome visitors speedily decamped—save a few hundred that happened to get scorched in their eagerness. Like causes, we opine, will produce like effects, both here and in California, and if we allure bees, we must expect to have them buzzing around us—no matter whether we fumigate our kitchen with honey, or anoint our stone-coal with molasses!

As to the depredations alleged to have been perpetrated by our favorites in the "several vineyards near Sacramento," we ask to be allowed to hold them guiltless, till we have some more conclusive evidence than mere newspaper *on dits* or the declaration of superficial vignerons. A competent jury would probably have discovered that before the bees "extracted the juices," some other insect had punctured the grapes, or over-ripeness had caused them to burst their skins. To ascertain the truth in the premises, let a duly qualified committee of investigation be appointed next season, by the grape-growers and horticulturists of that highly-favored land; and let the chairman be instructed to send us a copy of their report for publication.

 If, when examining a hive to ascertain whether the young queen has become fertile, we find one or more rudimental royal cells, containing eggs or larvae, we may safely conclude that the queen has been lost, and that the eggs were laid by a fertile worker.

Double Bottom-board.

The usual mode of enlarging hives, so as to furnish room for the storage of honey, adopted by those who use common hives, is called *storifying*, and consists in piling hives or boxes on or against each other, with a free communication between them. When an empty box or hive is placed on a full one, it is called *supering*; when placed under the full one it is called *nadiring*; and when placed against the side of the full one, with a communicating passage in the adjoining sides, it is called *collateral hiving*.

Though these several processes have long been employed, they have not, in any case, been permanently attended with satisfactory results. A different mode is now adopted by those practical beekeepers in Germany who still use the common hive, and is found to yield all the advantages which were expected from the former, without any of their disadvantages.

The desired enlargement is effected by means of what they call a double bottom-board, constructed to accommodate two hives or boxes.—This board is twice as long as an ordinary one, and in its central portion a channel, twelve inches long and four inches broad, is scooped out in such a manner that its greatest depth, midway, is $\frac{3}{4}$ of an inch, extending thence either way to the ends (*b, b,*) with a gradual upward slope. The central portion of the channel is covered with a piece of board six inches square and $\frac{1}{4}$ of an inch thick, which is let in flush with the surface of the bottom-board, thus forming a covered way or tunnel $\frac{1}{2}$ an inch in the clear at its deepest part, and amply large enough for the passage of the workers. In the middle of this board a narrow slit (*c, c,*) is cut, four inches long, or just the width of the channel, into which a piece of sheet-brass may be inserted, to close the passage below.

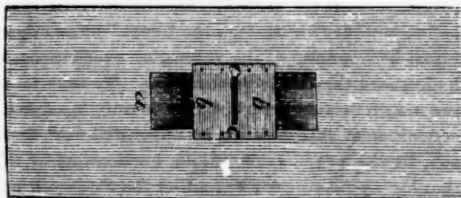


Fig. 1.

Fig. 1 shows such a double bottom-board, as constructed for hives which have the entrance for the bees in their base or lower edge. When the board is wanted for hives which require the entrance to be cut in the bottom-board, the construction is as shown in fig. 2.

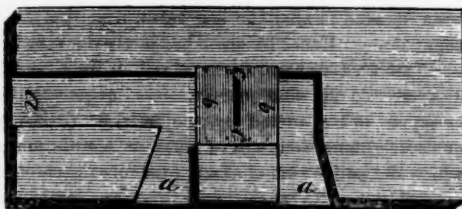


Fig. 2.

In this, three entrances (*a, a, a,*) are provided, so that whether the board is placed lengthwise or broadwise, there will, in either case, be a front entrance. The other entrances are, of course, kept closed when not in use.

Another and simpler kind of double bottom-board, chiefly intended for a different purpose, is represented by fig. 3.

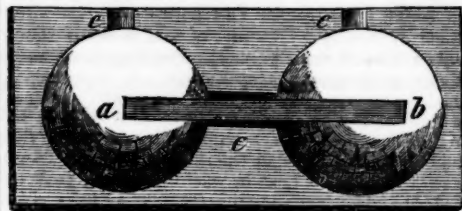


Fig. 3.

In this the channel is eighteen inches long, four inches broad, and three-fourths of an inch deep throughout. The hives are placed on it six inches asunder, and the intervening portion of the channel is covered by a piece of thick glass, (*g*) six inches broad, set in the board flush with the surface. This is protected by a suitable board, with a piece of dark-colored woolen cloth intervening. The entrances (*e, e,*) are cut in the bottom-board, if the hives used require it.

The manner of using these double bottom-boards will be explained, when treating of the management of bees in common hives.

SUPERSTITION.

Among the peasants of Livonia the genuine beekeeper never pronounces the word "*bee*," as he believes the expression would inevitably bring misfortune on his apiary. He always speaks of them as "*forest birds*," and however frequently or severely he may be stung, he bears the pain with mute stoical fortitude; never giving utterance to his feelings, for fear he should offend his "*forest birds*!"

Ants are frequently troublesome pests in an apiary. To get rid of them, mix equal parts of potash and sugar, pulverising the whole in a mortar. Set the mixture, in shallow plates, in places which the ants frequent.

Copulation of the Queen Bee.

JANSCHA, HUBER, and DZIERZON, relying on evidence entirely satisfactory to themselves, concurred in the conviction that the fecundation of queen bees is effected by the drones, on the wing, and in the open air, though neither of them ever actually witnessed the concourse of queen and drone. Many German apiarians have for years past been vigilant observers, in the hope of obtaining ocular demonstration of the fact; but so unsuccessful have they been, that one of them said of it despondingly, a short time ago, "human eyes have never beheld it, and probably never will."

In January, 1850, the *Bienenzeitung* contained an account of what came under the notice of Mr. Hanneman, then of Wartenburg, in Thuringia, but now of Rio Grande du Sol, in Brazil, where he established a large apiary, and made an ample fortune by bee culture. After stating that on the 6th of July, 1849, several swarms issued from his stocks and were hived, he adds:—"When the swarms had been placed in the apiary, and the bees commenced flying, I was anxious to watch them closely, but found it impracticable, as I had then about 150 colonies, many of which had become so irritated by my operations, that it was unsafe to approach them. The wind was from the west, and a few fleecy clouds floated in the atmosphere. While sitting in the shade of a tree, about thirty paces from the apiary, my attention was attracted by an unusually loud humming. Suddenly I saw some twenty or thirty drones in rapid pursuit of a queen bee, at an elevation of 25 or 30 feet from the ground. The cluster occupied a space apparently two feet in diameter, and in their course sometimes sunk to within ten feet of the ground, and then rose again, passing from north to south. I followed them about 100 paces, and then lost sight of them behind an intervening building. While they were thus pursuing the queen, the cluster presented this appearance—



except when it approached the ground. Then the mass became more condensed and circular, closing together so thickly that they seemed almost to touch each other as they flew, appearing thus—



Before they vanished from my sight, the queen made her escape from among the encircling drones by a sudden turn, and I saw her distinctly, shooting ahead, and rising higher in the air, the drones in full pursuit—the whole resembling this figure:—



This spectacle was corroborative, but not demonstrative; and this is the nearest approach any of the German apiarians have yet made towards obtaining an ocular solution of the problem.

American observers have been more successful, and may now claim the palm which their German brethren failed to secure. In the spring of 1857, Mr. Lewis Shrimplin, of Wellsboro', Va., enabled himself to obtain a distinct view of the pursuit of the queen by the drones, by catching one as she issued from her hive, and attaching a fine silk thread to one of her thighs. When again permitted to fly, she began to rise in the air, and he saw the drones collect in large numbers and follow in pursuit. This precisely confirmed the statement made by Mr. Hanneman, and furnished the additional fact that the queen, on her return, was found to bear the evidence of fecundation.

The Rev. Mr. Millette, of Whitemarsh, Pa., was more fortunate, and appears to have been the first who witnessed the actual encounter. The following communication from his pen, which we copy from the "*FARMER AND GARDENER*" for November, 1859, settles the important fact, as it came under his observation in the preceding summer:

"**DRONE AND QUEEN BEE.—IMPORTANT FACT.**—There is no department in Natural History where there is so much room for doubt and skepticism as in the study of the honey bee, and the reason is obvious—there is so much that is really wonderful, and at the same time true. Until late years, such has been the construction of the hive, that its internal economy has been hidden to the eye of man, and all the phenomena of bee life has been left to conjecture. The following fact occurred under the writer's own observation, and is put on record in order that others interested in bee keeping may be led to give their experience in the matter of the queen's impregnation, if any facts have come before them.

In the month of June, an old stock threw off a second swarm, in which there were four queens. During the process of hiving, one of the queens was observed on the wing, and in a moment after was seized by a drone. After flying about a rod, they both came to the ground in close contact; the writer instantly followed them up, and as the drone was about departing, (having broken loose,) seized both the bees, the queen in one hand and the drone in the other. They were taken into the house and left at liberty to fly, when the queen flew to the (closed) window, but the drone after crawling about on the hand, was laid upon the window seat, and in a very few minutes expired. Both the queen and drone had a white milky fluid upon the extremity of the abdomen, and upon pressing the drone, there was no indication of his possessing the speciality of his sex.

One fact will not establish a theory; but when many can testify in the same direction, it forms a galaxy of evidence which cannot be refuted. It is Huber's idea that the queens and drones meet

in the air, and it has occurred to the writer, as well worthy of experiment, to collect a number of drones and let them fly with a *virgin* queen in a high room, and thus endeavor to verify this fact, so emphatically laid down by Huber."

To this we append the following extract of a letter from Mr. S. B. Parsons, of Flushing, N. Y., confirmatory of all that was conjectural before. We may remark that the observers, in this instance also, are men whose statements may be implicitly relied on, and so familiar with bees that all doubt as to the possibility that they may themselves have been mistaken, is entirely precluded. Mr. Parsons says:

"One fact in our last summer's experience will interest the readers of the Journal. The copulation of an Italian drone and queen, upon the wing, was witnessed in my apiary by Mr. Carey and Mr. Otis.

They saw the queen issue from the hive, and circle round, when a drone struck her, (both being upon the wing). A sharp snap ensued, the drone fell to the ground, and was picked up dead. The queen fell in the grass, rose again, and entered the hive. Mr. Carey soon searched for her, found the workers cleaning her off, and the male organs attached to her body.

This settles definitely what Janscha and Huber believed without ocular evidence. I am not aware that the actual copulation has been seen before."

Since the foregoing was prepared, we have received the following more detailed account of Mr. Carey's observations, as communicated by him to a mutual friend, which we hasten to submit to our readers:

COPULATION OF A QUEEN AND DRONE ACTUALLY SEEN.

Although the copulation of the queen and drone undoubtedly takes place while they are on the wing, it will interest many to know that it has, at last, been seen. The following is the substance of a letter addressed to me by Mr. Wm. W. Carey of Coleraine, Mass. Mr. Carey has had much experience in the management of bees, and was engaged last summer in propagating Italian queens for Mr. S. B. Parsons, of Flushing, Long Island. He says:—

"About three o'clock, P. M., on the 8th of July, I saw a young Italian queen enter her hive without any signs of impregnation. She came out again in a few minutes, and I closed the entrance to the hive. During her absence, which lasted thirteen minutes, three drones came in front of the hive, and finding the entrance closed, kept on the wing most of the time. When the returning queen was about three feet from the entrance, one of the drones very rapidly flew to her and clasping his legs about her, caused both to settle a little and to come in contact with a long spear of grass. At the same time an *explosion* was distinctly heard, and they immediately separated—the drone falling to the ground perfectly dead, and having his abdo-

men very much contracted. The queen, after making a few circles in the air, entered the hive with the male organ of the drone attached to her. All these facts were witnessed by myself and Mr. R. C. Otis, of Kenosha, Wisconsin, as we were seated on opposite sides of the hive, not more than six feet apart—so that there can be no possible ground of mistake."

Prof. Siebold, in his work on "*Parthenogenesis*," says:—"As in the act of copulation the penis of a drone is completely extruded outwards, and as no particular muscular apparatus exists for the extrusion of the penis, the circumstance that the drones copulate in flight has an important signification. * * * During the movement of the wings, the different air-sacs of the tracheal system of the drones are filled with air, by which means these can act by *pressure*, in the interior of the body of the drone, upon the neighboring penis which is to be protruded."

On page 125 of "*Langstroth on the Hive and Honey Bee*," it is mentioned that while a drone is held in the hand, its male organ may often be made to extrude, with a motion very like the popping of roasted pop-corn. In every such case the drone perishes instantaneously, but its penis remains so firmly attached to the abdomen, that it has been difficult to conceive how it can be detached in the act of copulation. The "*explosion*" so distinctly heard by the two observers, shows that "the filling of the different air-sacs," while the drone is on the wing, *detaches* the penis.

L. L. L.

It is exceedingly gratifying to us that the "*American Bee Journal*," at this early stage of its existence, is thus distinguished as the medium of decisive information on one of the most interesting as well as most controverted points in the natural history of the bee. We have long believed that when once the physiology and habits of this admirable insect are made subjects of earnest and persevering study in this country, the many obscurities which have so long perplexed observers, will be satisfactorily elucidated; and the instances here given of success, under circumstances not more favorable than those by which Europeans have for years been surrounded, are well calculated to strengthen our faith and induce us to look for other cheering results.

According to an official census taken in 1853, there were then in the kingdom of Hanover, 218,865 colonies of bees. The Rev. Mr. Kleine thinks that, at a moderate estimate, the country could support at least ten times that number.

Bees never store pollen in drone-cells.

FIRST AMERICAN Beekeepers' Convention.

We take pleasure in placing on record in our columns, the proceedings of the first American Beekeepers' Convention, which met at Cleveland, Ohio, on the 15th of March, 1860. The time is approaching when bee culture will occupy a higher position than it has yet held in this country, and when it will be interesting to trace back its history to those pioneer movements which conduced to revival and progress.

[From the Ohio Farmer.]

BEEKEEPERS' CONVENTION.

First Day.

On motion of E. T. Sturtevant, Prof. J. P. Kirtland was elected Chairman, and J. Kirkpatrick, Secretary.

By S. C. Brown. *Resolved*, That a business committee be appointed by the Chairman, who announced S. C. Brown, A. F. Benton, Joel Merriman, E. T. Sturtevant and Dr. T. Garlick.

The Chairman presented communications from Samuel Wagner, Esq., of York, Pa., and T. J. Mahan, of Philadelphia—referring principally to the Italian bee, which were read by the Secretary.

The Committee reported that it is desirable to form a Beekeepers' Association, and also the following questions for discussion: 1. What is the best mode of wintering bees? 2. Is it policy to feed bees? If so, what constitutes the best feed? 3. Is natural swarming the most judicious mode of propagating bees? 4. What is the superiority, if any, of the Italian bee over our common kind? Accepted.

On motion, a committee of three was appointed to draft a Constitution, consisting of S. N. Sanford, E. T. Sturtevant and S. Miller, who reported a Constitution which was accepted and adopted.

A committee consisting of W. M. Cunningham, Eli Bartholomew and W. A. Flanders, was appointed to nominate officers, who reported. The ballot was then taken, when the following gentlemen were declared elected:

Prof. J. P. Kirtland, President.

Wm. M. Cunningham, Vice President.

E. T. Sturtevant, Corresponding Secretary.

J. Kirkpatrick, Recording Secretary.

J. Gallup, Treasurer.

T. W. Morse, S. C. Brown and L. M. Cobb, Executive Committee.

The meeting then took up the

FIRST QUESTION.

What is the best mode of wintering bees?

Mr. Sturtevant gave a history of his experience on this point. He said that the hive should be tight at the bottom, with an opening at the top during winter; and also stated that he had buried hives the past season, with the best results. The bees had increased in numbers, although many of the swarms were late ones, and not well supplied with stores. In a few minutes after being taken up, the bees were perfectly active.

Rev. L. L. Langstroth stated that at one time he deposited his hives in a deep cellar, that was very dry during the winter. The bees remained inactive, and came out well in the spring. At one time, he had an idea that it was necessary to have his hives with double walls, and filled between with charcoal or sawdust, but by experience found that the hive thus constructed did not do well. Air is absolutely essential. Cold did not kill them when in mass. It is necessary to have thorough communication between the combs. In his opinion, the thickness of the hive walls is non-essential, but an upper circulation must be had.

Mr. Merriman agreed with the previous speaker. When a boy, at the East, his hives, along with those of others, suffered from winter-killing, and the idea struck him that it was owing to the want of air, and bored holes in several of the hives with an auger. All the hives so treated did well; but those not ventilated suffered. Every beekeeper knows that bees generally winter well in some old hive, full of cracks, through which the air can circulate freely.

Dr. Metcalf asked if hives, buried in winter, would not do equally well covered with clay as with sand?

Mr. Sturtevant stated that he had covered his with sand, because he had no clay, but thought that clay would do better; upward ventilation was, however, necessary.

Mr. Merriman stated that an uncle of his buried his bees with good success, without ventilation.

S. C. Brown had lost many swarms. He did not believe that there was such a thing as *luck* in bee-keeping. Some of his swarms had died from an overplus of honey, the brood combs being filled with honey, leaving no room for new brood, and there was a consequent falling off in the population of the hive, the queen having no empty cells in which to deposit her eggs.

Mr. Langstroth read a quotation from Columella, in corroboration of this difficulty. In the time of that author, hives suffered from over-avarice.

Mr. Sturtevant said that swarms having no queen, often stored honey faster than those having one, but thought that the swarms mentioned by Mr. Brown had never had a queen, being divided ones.

The President said he had several hives that were so full of honey that they had no room for brood. He had lost no swarms the past winter.

Mr. A. K. Smith asked if bees would protect themselves when without a queen.

Mr. Sturtevant said that this is often the case.

Dr. Dunham asked why some divided swarms, having no queen, will lie idle until a queen is hatched out?

Mr. Sturtevant replied, that, in his opinion, this was owing to the small number of bees that were often left in such hives, and gave illustrations from his own experience.

Mr. Langstroth read from Butler's work, written and printed in the time of, and dedicated to, Queen Elizabeth, in illustration of this point; the same observations were made centuries ago.

Mr. Smith observed that many of his hives had suffered from an over-filling of the combs with honey.

T. S. Underhill remarked, that as the Association had left the question on which it started, he would, with its leave, return to the original subject. He had found one great difficulty in the burying of swarms, from the fact that when opened, the bees would come out and get mixed faster than the hives could be removed. He approved of burying in dry cellars, as the bees could be easily and gradually removed. Bees suffer from their inability to reach the outer combs during cold weather. They eat all the honey within reach, and then starve within a short distance of plenty. Upper ventilation is always necessary during the winter.

Mr. Sturtevant lost nineteen swarms in unventilated hives one winter, in consequence of sudden cold, chilling the bees while wet.

S. C. Brown remarked, that many lost swarms that were apparently in excellent condition last fall, from the combs being filled with eggs, and nearly all the honey deposited in the upper boxes, and this removed as surplus.

SECOND QUESTION.

Is it policy to feed bees? If so, what constitutes the best feed?

Mr. Smith said he usually took up an old hive that was of little use, destroyed the bees, and fed the young or weak swarms with it. He feeds by placing pieces of the comb in the upper boxes. The safest way to save young swarms is to feed old honey.

Mr. Merriman's profits from beekeeping exceeded that from any other kind of farm stock. Has fed good honey to his bees; did not approve of feeding poor honey, or any other substitute. Chestnut honey is the poorest he knows. Water mixed with bee-feed does not add to the quantity of the feed.

S. C. Brown considered that it was not good policy to feed. Our hives should be in such a condition that the bees do not need to be fed.

Mr. Sturtevant considered that feeding bees for the purpose of producing marketable honey, is a short road to the poor-house for the beekeeper, and gave a short account of the period during which honey is gathered. Strong swarms, by the first of May, will always collect sufficient stores. When, through improper division of swarms at a late season, a swarm proves light, it should be fed, or united with another swarm. Feeding by placing frames filled with comb and honey, is the best.

Mr. Langstroth approved in general of Mr. S.'s views, with a few exceptions. The idea that poor feed can be turned into good honey, is a stupendous swindle. Honey derived from different sources, has each its distinctive characteristics.

Second Day.

FRIDAY, MARCH, 16th, 1860.—The President, Prof. J. P. Kirtland, in the chair.

The President read an article from the Morning Leader, on the passage of a bill through the Legislative House, punishing bee-hive or honey stealing. This elicited considerable discussion, all agreeing, that at present there is no real law for the punishment of bee thieves. The committee on business reported the following resolution on the subject:

Resolved, That it is expedient for this Association to petition the Senate of the State of Ohio, to concur in the passage of the bill passed by the House of Representatives, for the more efficient protection of beekeepers.

Which was adopted, and a committee, consisting of Prof. J. P. Kirtland and E. T. Sturtevant were appointed to draw up such a petition. Moved, that the Corresponding Secretary be requested to confer with the census bureau at Washington, in regard to the necessity of the assessors taking an account of the number of bee-hives, and the amount of products in the various States.

Several questions were presented for discussion. The question for discussion was then taken up.

Mr. Merriman said that if bees were allowed to rob even from hives without bees, they would soon rob all round.

The President said he would feed his bees for the purpose of a general stimulus, but he would place the honey at a distance from the hives. Weak swarms should be fed in boxes within the hive.

Mr. Langstroth thinks that if a bee once gets into the habit of stealing, it will always steal, as long as it has an opportunity, even unto the day of its death. Robber-bees are easily known. They don't approach the hive like honest bees, but approach and then retire in a suspicious manner.

Mr. Smith had suffered from robbers; some of his swarms had become robbers a year ago, and still exhibit the same bad habit.

Mr. Langstroth would recommend that whenever a swarm endeavors to rob another, it is best to close the latter, and when the robbers cluster in masses on the outside, sprinkle them with cold water, and keep sprinkling them, they will go home cooled off.

Mr. Flanders advocated the feeding of robbers, as in his opinion they needed food.

Mr. Langstroth and Mr. Sturtevant agreed that it is not the poor, weak swarms that become robbers, but the old, strong swarms that have their hives stocked with honey. Mr. S. would cut down a comb and let the honey run in the robbers' hive, when they will immediately attend to affairs at home. He also advocated the feeding of weak swarms at night.

Mr. Bartholomew thought that swarms never rob unless food cannot be obtained otherwise.

Mr. Merriman agreed with others in thinking that few hives were robbed, unless without a queen. Hives that are attempted to be robbed, should be removed to a different stand. When a hive is fairly conquered, it is best to let the robbers have free leave to clear the hive out, and they will stop when the honey is exhausted.

Dr. Garlick found the strong swarms liable to rob, but found cold water sprinkled over, was a good plan to cool them off. He has found hives rich in honey, clear of bees this spring.

Mr. Underhill thinks that bees from weak swarms are the first invaders, but that in the battle the strong ones are the victors. Queenless colonies may be expected to be robbed. He gives all his swarms plenty of honey. Weak swarms should have the entrances contracted in the spring, as by this means they can the more easily protect themselves. Some years ago, his hives had to be

fed generally in the spring, owing to the unfavorable weather during the honey season the previous summer, hindering them from laying up sufficient honey. That season he suffered more from robbers, than at any previous or subsequent period.

Mr. Bartholomew thought that making artificial honey for the purpose of feeding bees, is very poor business. A little feed given early in spring, will encourage breeding, and thus benefit the swarm. Bees quit breeding when the pasturage ceases.

Mr. Langstroth considered that much fall robbing is the result of careless handling, in removing honey or opening hives; care should always be taken in this. Bees will breed when not collecting honey. Aristotle mentions that wet seasons produce great swarms, dry ones much honey; and this observation was made by many of the older writers, as well as moderns.

Mr. Sturtevant said that from the closest observation, he had learned that bees began to breed by the first of January, in a little spot; with the advance of the season, this increased in size.

AFTEENNOON SESSION.

Bee Bread.

Mr. Sturtevant had used unbolted rye flour as a substitute for pollen or bee-bread. In one day, his bees had taken up as much as sixty pounds. His method of using this, is to take a wide board with slips about two inches deep, nailed all round and placed in a warm, sheltered situation, and on that place the flour.

Mr. Langstroth said that rye-flour is used to a great extent in some parts of Europe. Breeding is sometimes suspended in new swarms from the want of pollen, as such swarms are usually deficient in the supply of bee-bread. In his opinion, artificial pollen is not equal to the genuine article.

Italian Bee.

On motion, the character and history of the Italian bee was taken up.

Mr. Langstroth stated, that Mr. Wagner, of York, Pennsylvania, endeavored to introduce the Italian bee five years ago, but the swarm arrived dead, in consequence of the mate of the vessel stealing the honey; and also read from Virgil and Columella, showing that this bee was well known to the ancients. The claims for this bee are that they are hardier, swarm oftener, and work during days when the common bee will not work. They also fly faster, and are in all respects more active insects than the others. It is believed that the tongue of this insect is longer than that of the common species, and it is thus enabled to obtain honey from sources incapable of being reached by a shorter tongue; for example the red clover. He considered that in the hands of the mass, the Italian bee would prove a failure. Some, however, would succeed, and its good qualities be brought out. Last fall, Messrs. Wagner, Mahan, and himself, had imported a few stocks of these bees, and this was prior to the importation of Mr. Parsons and the Patent Office.

Mr. Sturtevant would do what he can to protect beekeepers, and hopes that all will take care from whence the Italian queens, they may obtain,

come; and that they be not received from regions where the disease called "foul-brood" is prevalent, a disease utterly unknown in Ohio or the West.

Prof. Kirtland said that if the Italian bee was a distinct species, it would be easily retained; but if only a variety, it would take a great deal of care to keep them distinct, in places where the common species was abundant, in consequence of inter-breeding.

Mr. Langstroth said native queens, fertilized by the common drone, would produce hybrid workers and queens, but pure Italian drones, so that the next generation would be more Italian than common, and future generations will prove still purer.

Mr. Underhill described the appearance of "foul-brood." At the beginning of the disease, the cap of the cells turns dark, in consequence of the death of the larvæ. At first it appears yellowish; after a year or two, all the combs will be affected, and the stench is great from the decomposed matter. Honey from such hives fed to other swarms, will infect such swarms, increasing the disease. A queen taken from an infected hive, will lay eggs that do not produce diseased brood. It seems to be confined to pine regions, and is not known in the places where such trees do not grow. Boiling infected honey and skimming it, deprives it of its noxious qualities. If we find a hive slightly affected, we drive the swarm out and place them in a new hive. Hives clear of disease in summer, will often prove infected in the fall. An infected hive should not be allowed to remain in the apiary in spring.

On motion, it was resolved that our Representative in Congress, Mr. Wade, be requested by this Association to procure from the Patent Office, for the use of this Society, a colony of Italian bees; and if he succeeds, the colony be intrusted to the care of the President of the Society, together with two other members, viz: Mr. W. A. Flanders and E. T. Sturtevant.

Natural vs. Artificial Swarming.

The next question for discussion being, "Is natural swarming the most judicious mode of propagating bees?"—Mr. Sturtevant observed that he would rather that some other person would speak on the subject. It is conceded, at this time, that hives can be artificially swarmed. He considered artificial superior to natural swarming, as the former have more time to collect stores, and there is no loss from swarms leaving, which is a great drawback to keekeeping.

Mr. Langstroth said that for ignorant persons, natural swarming is the best; but in the hands of intelligent beekeepers, artificial swarming is preferable. The watching for the swarming of bees is avoided in the latter case. It is far more profitable, even with the common box-hive. Swarms seldom leave large apiaries, and it is seldom that a swarm can pass over such without. Mr. L. explained his method of dividing swarms.

Mr. Underhill said that if apiarians in his section of country, would depend on natural swarming, there would be but small increase. If a rapid, sure increase is desired, artificial swarming must be resorted to. It is also much cheaper, for it requires less attention and labor.

Bee Houses.

Question.—Is it a fact that bees will not prosper in a well-constructed bee house; or what are the advantages and disadvantages of such an apiary?

Mr. Langstroth considered that bee-houses were not the best for the benefit of the apiarian, principally from the loss of the young queens when they leave the hive for the purpose of meeting the drones, as they are apt, on their return, to enter the wrong hive, and be there killed, and the consequent decay of the queenless swarm; giving a great number of instances of this being the case. He would say to all, *scatter your bees*; place one hive under this tree, and another under that, but *scatter the hives*. A scientific beekeeper may succeed in using a bee-house.

Mr. Flanders endorsed the opinion of Mr. Langstroth, and also found that hives scattered about the orchard have done the best. It cannot be expected that bees will succeed well in a covered bee-house.

Mr. Sturtevant uses a large bee-house, but does not allow the bees in it to swarm, but always divides his swarms, taking the queenless swarm away from the apiary, and if desirable, returning it to the house after the queen is fecundated. He would use out of the house, or in a bee-house, the common hive with frames, (the Langstroth hive, manufactured by Ransom, Cobb & Co., Cleveland.) Hives must not be placed on a common level, where they can run from one to another. His bees had laid up an immense quantity of honey the last season; the house is airy and cool, built of brick. Hives should face in different directions.

The President stated that if a buffalo robe, bundle of straw, or other unusual object be placed on the old stand, from whence a hive has been carried, the bees will, when they return to the old stand, immediately leave for the hive.

Mr. Merriman moves his bees wherever it is desirable, and never has any difficulty.

Mr. Underhill thought that hives, when moved, should be stirred up, agitated; they will then look out when they issue in search of food. He did not approve of bee-houses. Adjourned *sine die*.

J. P. KIRTLAND, *President*.

J. KIRKPATRICK, *Secretary*.

BEE MART

In the village of Amersfort, in Holland, a regular *Bee Market* is held annually in the second week of August, after the buckwheat blossoms cease to furnish pasturage. The beekeepers in the surrounding districts then drum out the bees of such stocks as they do not intend to reserve for wintering, and bring them to market for sale, in small hives provided with a feeding apparatus. The bees are bought by dealers, who transport them to the heath districts, where ample fall pasturage enables them to build new comb and gather a plentiful supply for the winter. Six thousand stocks thus drummed out, were sold at Amersfort market, in August, 1857.

[For the Bee Journal.]

Inquiry.—Narrow Hives.

Would it not be advantageous to place natural swarms or artificial colonies in narrow hives, affording them no more room than the crowd can properly fill, and giving them, at the start, just so many frames as bees can conveniently, yet fully, cover? Would they not, in such hives, be constrained to build straight combs, impelled to do so by their crowded state, the shape and narrowness of the hive, and the high and equable temperature maintained while founding and extending their works? Do not swarms work more industriously in small hives; and when the bees become too much crowded, will it not be easy to give them more room by transferring one or more combs containing sealed brood to some other similar hive, and inserting empty frames instead? May not such narrow hives, with the aid of reserve queens, be used as workshops for the production of comb and brood? And where a considerable number of such are kept for this especial purpose, may not the beekeeper be enabled, by the removal from them of comb with sealed brood, at proper intervals, to build up new colonies easily by means of comparatively few bees, while the weather and pasturage are favorable? Such small colonies would, of course, need close watching; but if they built straight combs and produced brood rapidly, might they not be turned to good account in an apiary? †

Dr. ASZMUSZ, of Podolsk, near Moscow, says that while cultivating bees in common hives, he observed that first swarms built their combs from front to rear in their hives; the first after-swarms built them diagonally; and the second after-swarms built them from side to side. If he united a first with a second after-swarm, the combs were built diagonally, except one or two in front nearest the entrance, which always ran parallel with the front.

Has this been noticed by any other beekeeper? If it be a fact, it may perhaps serve to explain the irregularity in comb-building occasionally complained of in movable frame hives.

✂ In Galicia, in the southern part of Poland, the annual product of wax is about 750,000 lbs.; and of honey 15,000,000 lbs.

✂ The bees cultivated in the northern districts of China, appear to be only a variety of the common kind, somewhat smaller in size.



AMERICAN BEE JOURNAL.

Philadelphia, March, 1861.

TO CORRESPONDENTS.

All who are interested in the subject of Bee Culture, are respectfully requested to contribute to our columns. Communications to insure insertion, should be sent in by the first of the month at the latest, and as much earlier as possible.

Address them to A. M. SPANGLER & Co., Publishers, "AMERICAN BEE JOURNAL," No. 25 North Sixth Street, Philadelphia.

A number of Inquiries, Suggestions and Communications, have been received, but at too late an hour for our present number. They will be attended to in our next.

CLUBS! CLUBS!!

Our thanks are due to the friends who have given us the benefit of their influence in behalf of the Bee Journal, by raising handsome clubs. We hope their wholesome example will be followed by many others. Why should it not be? The terms are exceedingly liberal, and the quality of the matter furnished such as should satisfy every one. Every day will add to the interest and value of the "Bee Journal." Every day brings us new correspondents, and new facilities for adding to the interest and value of its contents. All that is now wanted, is a united effort on the part of Beekeepers generally. Will they make it? We hope they will.

THANKS!

We again tender our thanks to our editorial brethren, for the very handsome notices they have been pleased to give our Journal. It may be a gratification to them to know that a most lively interest has been awakened in its behalf, and that there is everything in the future to encourage. The Beekeeping community have resolved, and we think will, undoubtedly, sustain the only effort that has ever been made, to establish a purely American Bee Journal.

PRINTING.

We are prepared to execute orders for Plain and Fancy Book and Job Printing, at short notice, in good style, and on reasonable terms. We give special attention to Catalogues, Pamphlets, &c. Those who desire good work, at low rates, are requested to call and examine specimens.

APIARIAN CONVENTION.

We learn that a Beekeeper's Convention is to be held at Cleveland, Ohio, on the *second Tuesday* in March next. We hope it will be well and numerously attended.

REMITTANCES.

Those who wish to remit money for subscriptions are respectfully requested to observe the following suggestions:—

Give the Name, Post Office, County and State in full. Write them so plainly that they can be read with ease.

In sending money we prefer gold. Gold dollars can be sent with safety, if fastened to the letter sheet by having a small piece of paper glued or pasted over them.

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SEND US THE NAMES OF BEEKEEPERS.

Quite a number of friends have complied with the request made in our last, regarding the names of Beekeepers. We now repeat the request, as we are very desirous, if possible, of bringing the Bee Journal before the notice of every apiarian in this country.

Send us names, friends! and we will supply the specimen copies.

ADVERTISEMENTS.

Those of our readers who have Hives, Bees, or in fact anything connected with the Apiary to sell, will find a most desirable medium in our advertising department. We are printing large editions, which are distributed freely amongst Beekeepers and others, in every portion of the country. Our terms are liberal, and may be found on second page of cover.

Monthly Management.

MARCH.

Though February may have been too cold and inclement to allow the bees to fly, this month will almost certainly afford them frequent opportunities to leave their hives. On the first occasion that they can issue freely, all the colonies should be carefully watched, to ascertain whether any among them are queenless. Those which manifest no uneasiness and remain quiet in the hive, after they have ceased to fly, may be regarded as in good order in this respect. But such as appear restless and discontented, passing in and out of the hive with a dissatisfied air, and running hurriedly over the front and sides of the hive, may be looked upon as certainly queenless—more especially if, on lifting the hive slightly and blowing in some smoke, they utter a peculiar plaintive moan never heard under other circumstances.

A queenless colony, at this season of the year is of little value as an independent stock, and had better be at once united with some feeble colony having a fertile queen, if there be any such in the apiary: if not, then unite it with its nearest neighbor. The attempt to rear a queen would most probably result in disappointment; and if the colony be suffered to remain on its stand till spring fairly opens, it will, in all likelihood, be attacked and destroyed by robbing-bees, for these would speedily discover its destitute condition.

When weak stocks which have a fertile queen happen to be assailed by robbers, and cannot conveniently be removed from their stand, it is advisable to contract the entrance so that only two or three bees may pass at a time; and it will be serviceable also to rub the alighting board and front of the hive with garlic, onions, wormwood, or other acrid substance which bees dislike. The odor of the bees' poison and of formic acid is likewise useful in such cases, and may be employed in like manner to repel robbers. A piece of paper dipped in formic acid may be used as a blind at the entrance of the hive, to conceal it and deter the assailants.

As the weather grows warmer, the bees spread themselves over a greater number of combs, cleansing them of impurities, removing all the dead, and carrying out also the droppings which lie on the bottom-board. This is a laborious task for them, and many bees perish while thus engaged. It is consequently advantageous to relieve them of the labor as much as possible, by lifting the hive and brushing out all the droppings and dead bees lying under the combs; or by re-

moving the bottom-board and substituting a clean and dry one. A few extra boards should be kept for this purpose, so as to expedite the operation, while the weather is mild enough to permit the exchange to be made without detriment to the brood or the bees. Combs which have become soiled or mouldy may now also be pruned, removing only such portion as is objectionable or useless.

If the bees are kept in movable comb hives, one or more extra hive should always be provided, so that on some favorable opportunity, the frames, combs and bees may readily be transferred into a clear and dry hive, from the one in which they were wintered. This is the speediest and most effectual mode of "cleaning house" and getting rid of impurities and refuse matter. After the transfer has been made, the interior should be thoroughly scalded and washed, and well dried to prevent mouldiness, so as to have it ready for future use. Unless the weather continue unusually cold, brooding will now be commenced, even in the weaker colonies, and be already abundant in the stronger or more populous. Though not in itself desirable at so early a period in northern districts, it is in fact as difficult to prevent or restrict, as it is to keep trees and plants from sprouting on the approach of spring. Still it is well not to encourage or promote brooding by any interference on our part. That would be as injudicious and injurious as it would be to urge trees and plants into bloom earlier than the season justifies.

Stimulative feeding, resorted to by many at this season, is generally useless. The food and time devoted to it are almost invariably wasted. The bees so fed are impelled to issue and fly at times when the weather is unfavorable, and many more perish from exposure than the brood supplies. Stimulated colonies are usually weaker when forage begins to abound than those which were not fed, or fed only sparingly as the exigency required. Even meal feeding, undertaken early, is disadvantageous for similar reasons. It should be resorted to only when the season is so far advanced that there is a reasonable prospect of continuous mild weather.

Certain special objects may certainly, at times, be attained by a system of artificial forcing; but great judgment and skill are indispensable to success. Beginners in bee culture should use it sparingly, by way of experiment—venturing to use it on a larger scale only when by practice and observation, they have learned to employ it judiciously. Ordinarily it is best to wait patiently till the bees can gather pollen from the hazel, the alder and the willow, before undertaking to stimulate them by feeding diluted honey or other saccharine substitutes. Brooding generally commences early enough; and if encouragement be needed, it is more advantageously extended three or four weeks before the fruit trees blossom. If the weather is raw and blustering, the bees should remain undisturbed till the spring fairly opens.